

What is claimed is:

1. An apparatus for use in certification of accuracy of a vehicle wheel aligner system, comprising:

two axles of equal length;

a stub shaft located along a longitudinal axis of each respective axle, at each end of each  
5 respective one of the two axles;

two side spacers of equal length, each end of each of the two side spacers having an opening for receiving one of the stub shafts, to allow attachment of the two side spacers to the ends of the axles to thereby form a parallelogram frame from the axles and side spacers;

four plates, each respective plate being adapted to facilitate attachment thereto of a head  
10 of a vehicle wheel aligner system under test, and each respective plate being mounted on one of the stub shafts at an end of one of the axles; and

a plurality of stands adapted to support the frame in a position to allow the vehicle wheel aligner system under test to measure a parameter of the apparatus from the attached heads of the vehicle wheel aligner system under test, for comparison to a known parameter of the apparatus.

2. The apparatus of claim 1, in combination with a diagonal spacer, for use in setting lengths of diagonals of the frame to be equal during assembly of the frame so as to form the frame with a rectangular shape.

3. The apparatus of claim 1, wherein length of each of the two side spacers is adjustable.

4. The apparatus of claim 3, in combination with a distance setting shaft of a predetermined length, for use in setting the length of each of the two side spacers to the predetermined length before attachment thereof to the axles at the stub shafts.

5. A jig for use in certification of accuracy of a vehicle wheel aligner system, comprising:

two axles of equal length;

two side spacers of equal length;

5 a coupler at each end of each of the two side spacers, allowing attachment of the two side spacers to ends of the two axles, to thereby form a parallelogram frame from the axles and side spacers, and to allow detachment of the two side spacers from the ends of the axles to disassemble the frame;

10 four plates, each respective plate being adapted to facilitate attachment thereto of a head of a vehicle wheel aligner system under test, and each respective plate being mounted on one end of one of the axles; and

a stand system adapted to support the frame in a position to allow the vehicle wheel aligner system under test to measure a parameter of the apparatus from the attached heads of the vehicle wheel aligner system under test, for comparison to a known parameter of the jig.

6. The jig of claim 5, wherein:

each end of each of the axles comprises a stub shaft; and

each coupler comprises a pivotable member attached at a respective end of one of the spacers having an opening for receiving one of the stub shafts.

7. The jig of claim 5, in combination with a diagonal spacer, for use in setting length of a diagonal of the frame during assembly of the frame, such that the frame becomes rectangular.

8. The jig of claim 5, wherein the stand system comprises four independent stands, for supporting four corners of the frame.

9. The jig of claim 5, wherein each respective side spacer comprises means for adjusting the length of the respective side spacer.

10. The jig of claim 9, wherein:

each end of each of the axles comprises a stub shaft;

each coupler comprises a pivotable member attached at a respective end of one of the spacers having an opening for receiving one of the stub shafts; and

5 the means for adjusting the length, on the side spacers, comprises threaded connections of the couplers to the ends of the side spacers.

11. The jig of claim 9, in combination with a distance setting shaft of a predetermined length, for use in setting the length of each of the two side spacers to the predetermined length before attachment thereof to the axles at the stub shafts.

12. The combination of claim 11, wherein the distance setting shaft includes two quasi-stub shafts at the distance setting shaft for inserting into openings of pivotable members of either of one of the side spacers, when the one of the side spacers has the predetermined length.

13. An assembly for use in certification of accuracy of a vehicle wheel aligner system, comprising:

a jig comprising:

a) two axles of equal length;

5 b) two side spacers of equal length;

c) a pivotable coupler at each end of each of the two side spacers, allowing attachment of the two side spacers to thereby form a frame from the axles and side spacers, and to allow detachment of the two side spacers from the ends of the axles to disassemble the frame;

10 d) four plates, each respective plate being adapted to facilitate attachment thereto of a head of a vehicle wheel aligner system under test, and each respective plate being mounted on one end of one of the axles; and

e) a stand system adapted to support the frame in a position to allow the vehicle wheel aligner system under test to measure a parameter of the apparatus from the attached heads of the vehicle wheel aligner system under test, for comparison to a known parameter of the jig.

14. The assembly of claim 13, wherein:

the side spacers are adjustable in length; and

the assembly further comprises at least one setting bar, for setting a predetermined configuration of the jig during assembly.

15. The assembly of claim 14, wherein the at least one setting bar comprises a diagonal spacer, for use in setting lengths of diagonals of the frame to be equal during assembly.

16. The assembly of claim 15, wherein the diagonal spacer comprises two sections and a detachable coupling for connecting the two sections together.

17. The assembly of claim 15, wherein the diagonal spacer comprises means for adjusting the length of the diagonal spacer.

18. The assembly of claim 15, wherein the at least one setting bar further comprises a distance setting shaft for use in confirming that the length of each of the two side spacers is adjusted to a predetermined equal length before attachment to the axles at the stub shafts.

19. The assembly of claim 14, wherein the at least one setting bar comprises a distance setting shaft of a set length, for use in confirming that the length of each of the two side spacers is adjusted to a predetermined equal length before attachment to the axles at the stub shafts.

20. The assembly of claim 19, wherein the distance setting shaft comprises:

means for attaching ends of the distance setting shaft to the couplers of either of the side spacers; and

5 means for adjusting and setting length of the distance setting shaft to define the predetermined equal length for the side spacers.

21. A method of certifying calibration of a vehicle wheel alignment system, comprising:

checking length of two side spacers of a rectangular certification jig for proper equal length;

5 assembling two equal-length axles and the two side spacers into a predetermined parallelogram shape of the certification jig;

checking at least one diagonal of the certification jig, to insure that the jig is assembled so as to form the predetermined parallelogram shape;

mounting heads of the wheel alignment system at opposite ends of the axles;

10 operating the wheel alignment system to measure a parameter of the certification jig from the heads mounted on the jig;

comparing the measured parameter to a known value of a corresponding parameter of the certification jig; and

if the result of the comparison shows that the measured parameter is within a standard  
 15 acceptable range of the known value of the corresponding parameter of the certification jig,  
 certifying the alignment system as accurately calibrated.

22. The method of claim 21, wherein the predetermined parallelogram shape is a  
 rectangle, and the step of checking comprises setting diagonals of the parallelogram shape to be  
 equal so as to insure that the shape is a true rectangle.

23. The method of claim 21, wherein the wheel alignment system is an image  
 processing type aligner.

24. The method of claim 21, wherein the step of comparing comprises:  
 acquiring certification measurement data, storing certification data and performing  
 calculations on the acquired data, with the wheel alignment system; and  
 the step of certifying comprises producing certification results for said wheel alignment  
 5 system.

25. An apparatus for use in certification of accuracy of a wheel aligner, comprising:  
 a frame, and mounts on the frame for supporting heads of the wheel aligner system,  
 wherein:  
 the apparatus is easily portable, and  
 5 the frame is configured so that the mounts support the heads at locations approximating  
 wheelbase and track width dimensions of a vehicle which may be measured using the wheel  
 aligner.

26. A method of certifying calibration of a wheel aligner, comprising:  
 positioning measuring heads of the wheel aligner at locations on a precise known shape  
 of a portable, vehicle-sized jig;  
 recording an alignment measurement of the jig with the wheel aligner;  
 5 comparing the measurement to known geometry of the jig; and  
 determining accuracy of the wheel aligner from the comparison.

27. The method of claim 26, further comprising:

assembling connectable spacers and axles, so as to form the jig with the precise known shape, prior to positioning the measuring heads; and  
after the determining of the accuracy of the wheel aligner, disassembling the jig.

28. The method of claim 26, wherein the wheel aligner performs steps comprising:  
acquiring certification measurement data from the measuring heads,  
storing certification data,  
performing calculations on the acquired data, and  
producing certification results for said wheel aligner system.